

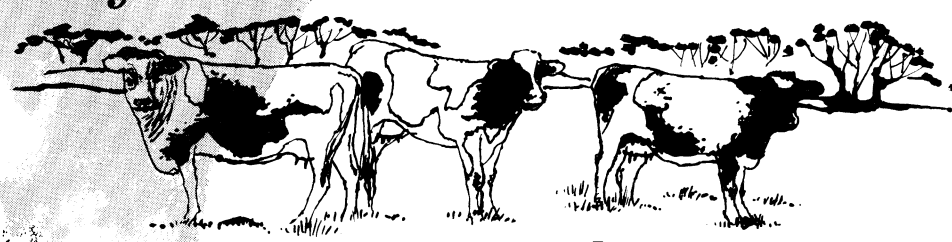
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IMPROVING your DAIRY HERD

*Through the
National
Cooperative
Dairy Herd
Improvement
Program*



FARMERS' BULLETIN NO. 2132
U. S. DEPARTMENT OF AGRICULTURE

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Prepared by
 Animal Husbandry Research Division
 AGRICULTURAL RESEARCH SERVICE

This bulletin supersedes Farmers' Bulletin 1974, The Dairy Herd Improvement Association Program.

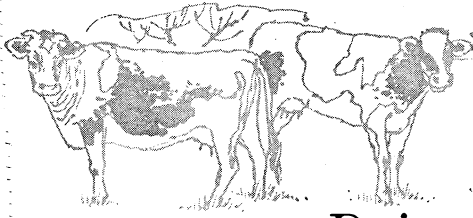
Washington, D. C.

Issued January 1959

For sale by the Superintendent of Documents, U. S. Government Printing Office
 Washington 25, D. C. - Price 10 cents

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IMPROVING YOUR DAIRY HERD



Through the National Cooperative Dairy Herd Improvement Program

Culling, feeding, and breeding are the ways to higher milk production for your dairy herd. Use all three.

- Cull unprofitable cows to avoid further loss from them.
- Feed to get the most profit from each cow.
- Breed to raise inherited milk and butterfat production.

You can guess at how to cull, feed, and breed. But experience shows that most guesses are not good. It is easier and more profitable to use records. Join and participate in the National Cooperative Dairy Herd Improvement Program that is available in your area; use records of each cow's performance to help you cull, feed, and breed.

CULLING— WITH RECORDS

Your herd—large or small—will be more profitable if you cull the lowest producers. Compare production costs on each cow. Use monthly records that show her production and its value, cost of her feed, and income over feed cost.

As soon as you have 2 or 3 months' records, you will find some

cows that should be culled because they yield little or no profit. As the records pile up, you can plan replacements.

How much milk or butterfat must a cow produce to be profitable? There is no easy answer to that question. Conditions vary; a profitable level of production on one farm or in one area may be unprofitable in another. But you can answer the question yourself by studying your herd records.

Generally, the market value of a cow's milk and butterfat must be at least twice the cost of her feed. Each cow should return at least \$2 for each dollar's worth of feed she eats in order to pay for her feed, the labor you expend on her, and a proportionate share of your overhead, interest on investment, and depreciation. A cow that returns less than \$2 for each dollar's worth of feed may not actually lose money for you, but you should replace her with a higher producing cow as soon as possible.

If your production costs are moderate or low or the price you get for milk or butterfat is high, you may net a small profit on a cow producing no more than 200 pounds of butterfat per year. If your costs are high and prices low, a cow

producing as much as 300 to 500 pounds may not be profitable.

With feed and production records, you can determine the level of production below which you must cull to avoid financial loss and to obtain the greatest returns for capital and labor invested.

You can arbitrarily set a production level that your cows must equal or exceed to remain in the herd. Perhaps you will cull a 3- or 4-year-old cow that fails to produce more than 300 pounds of butterfat per year or a mature cow that fails to produce more than 350 pounds of butterfat per year. Or your culling deadline may be higher. Even though a cow returns a profit, a progressive dairyman will remove her from the herd any time he can replace her with a more profitable cow.

Culling unprofitable cows from the herd helps you to avoid further loss from those particular cows, but it does not recover the losses al-

ready incurred. Because of the cost of raising and keeping a heifer until she comes into milk, she usually does not begin to return a net profit until the end of her second or third lactation. If a heifer proves to be a poor producer and must be culled during her first or second lactation, she never pays the cost of raising her. To solve this problem, you must improve the breeding of your herd so that fewer heifers born in your herd will turn out to be poor producers.

FEEDING— WITH RECORDS

Your herd will produce milk and butterfat most efficiently if you properly feed and handle each cow. For details on selecting an economical dairy ration, ask your county agricultural agent or write to your State agricultural college or to the U. S. Department of Agriculture. Many cows are low or unprofitable

Does your dairy herd show a profit each year? Do you have money left after paying for feed, labor, housing, interest on your investment, and other production costs? The answers depend on the price of milk, of course. But, at the same milk prices, some herds show a good profit while others show a loss. And, within the same herd, some cows more than pay their way while others fail to break even.

The reason for these differences is seen in the accompanying chart,

based on official Dairy Herd Improvement Association records. Within the range shown, feed cost of producing 100 pounds of milk decreases as level of production increases. When production climbs, cost of production increases, but at a slower rate. Doubling production raises costs about one-third—the amount depends on the cow. Because of this, your chances for making a profit—and the amount of profit—increase as each cow's production goes up.

Good cows show biggest profits.

producers simply because they are not given as much feed as they could convert into milk. But a cow also may be unprofitable if she is given more feed than she can use for milk production. With production records to guide you, you easily can determine how much feed each cow should have in order to make the greatest profit.

As soon as you have the first month's production records on your cows, you can adjust your feeding schedule to supply each cow with the amount of feed she needs to keep up her milk flow. When you have more complete records on which to base your calculations, you can feed each cow at her most profitable level.

Generally, if you give a cow all the feed she can convert into milk and butterfat, she will produce at her maximum efficiency or profitability. In practice, however, many factors influence the profitability of milk production. If,

for example, grain is high in price and milk is relatively low in price, it may be more profitable to feed less grain and to depend more on roughage even though less milk is obtained. If price of milk is high and price of feed is relatively low, usually you will find it profitable to feed grain at a heavier rate.

Whatever the ratio between the price of feed and the price of milk, feed and production records will show the level of feeding you must follow to obtain the most profitable return from each cow in your herd.

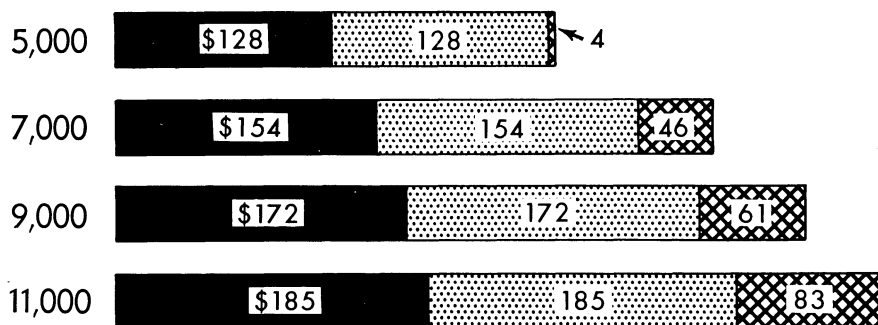
BREEDING— WITH RECORDS

Regardless of how well a herd is fed and cared for, it cannot produce more than its inheritance enables it to produce. If, for example, the inherited producing capacity of your herd is limited to an average of 350 pounds of butterfat per cow per year, no amount of ex-

HIGHER PROFITS

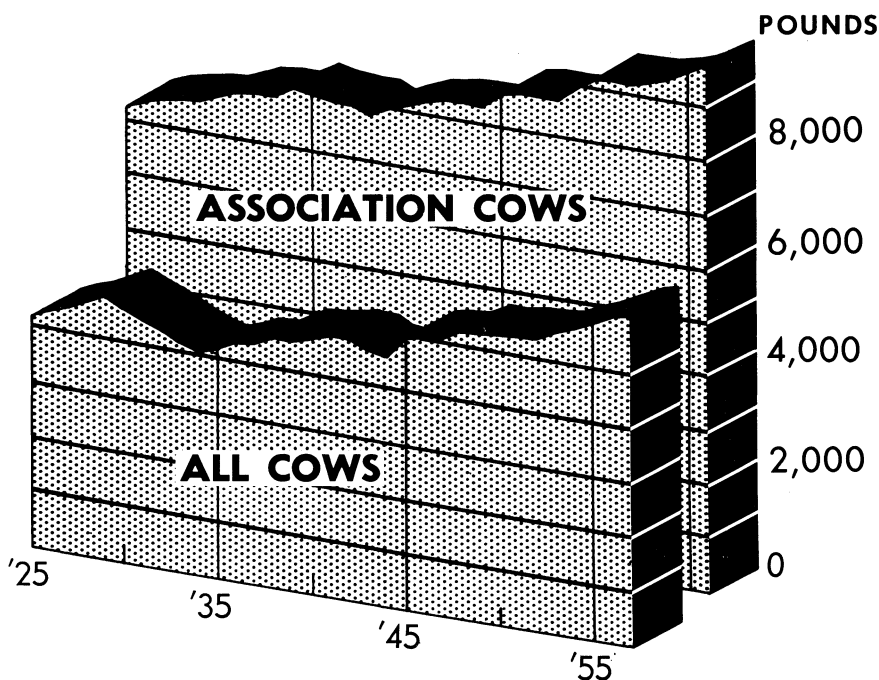
With Higher Production per Cow

POUNDS OF MILK



Feed cost
 Other costs (labor, depreciation, overhead)
 Net profit

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BN-6957

Every year, association cows produce more milk because their owners keep and use records.

tra feeding or better management will increase production. After you cull your herd carefully and feed the remaining cows properly, you are ready for the next and most important step in dairy-herd improvement—breeding to improve the inherited producing capacity of your herd.

Production records are essential for selecting breeding stock and for measuring progress in breeding better cattle. Your herd records will show that you must select your breeding stock carefully, particularly the herd sires, if you are to avoid raising a large percentage of heifer calves that turn out to be unprofitable cows.

The quickest and surest way to improve the inherited producing capacity of a herd is through the use of a series of good herd sires.

It often is said, "The bull is half the herd." Actually, however, a succession of herd sires becomes practically the whole herd in time. The daughters of a bull each receive half their inheritance from the bull and half from their respective dams.

In one generation, the sire contributes 50 percent to the genetic makeup of the new heifers in the herd. Seventy-five percent of the genetic makeup of the second generation is contributed by the sires used in succession. In only a few years the inheritance of the herd can be almost completely reconstructed.

Usually, about 20 percent of the cows in a herd are removed each year and replaced by first-calf heifers or purchased cows. In this way, about every 5 years the average

Proved Sires

A sire is proved by comparing the production records of his daughters with the records of their respective dams. If the comparison includes records of 5 to 9 daughters and their dams, the sire proof is considered preliminary. If the comparison includes records of 10 or more daughters and their dams, the sire is considered proved. The proved-sire record may show that the sire has transmitted high- or low-production ability to his daughters.

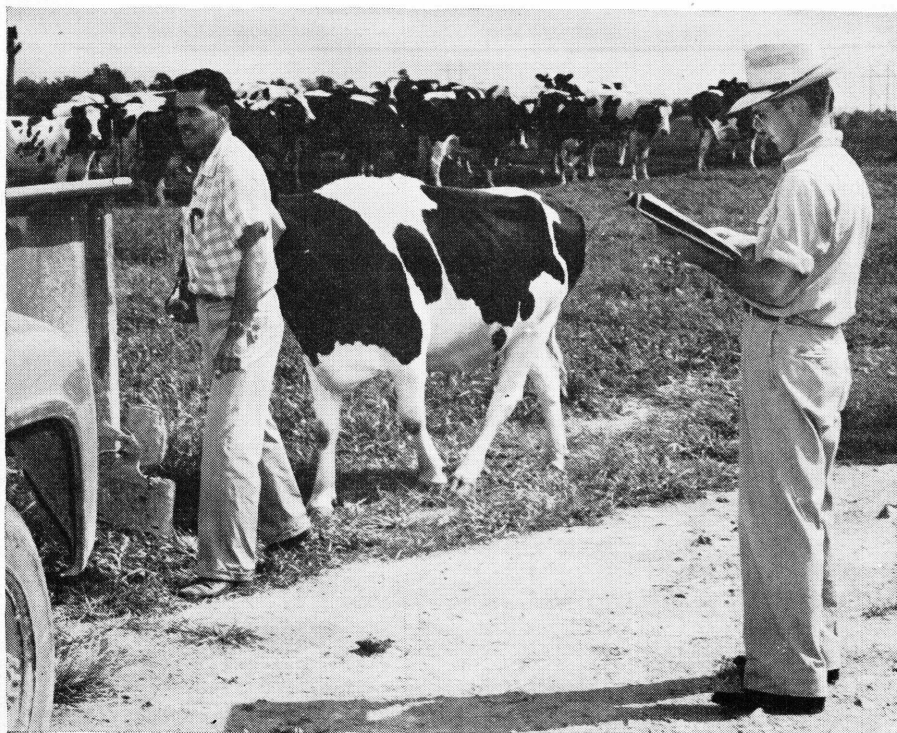
Choose a proved sire to use in your herd from those whose daughters showed increased production

over their dams. Compare the milk and butterfat production of these daughters with production in your herd.

Because dairy cattle artificial breeding organizations operate in practically every dairy section of the country, you have access to breeding services from many carefully selected sires.

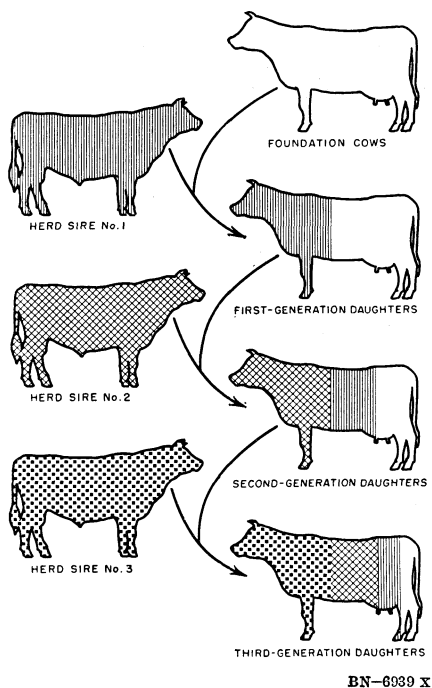
Your county agricultural agent or State extension dairyman can advise you in the use of proved sires.

If a good proved sire is not available, use the son of a good proved sire.



N-29307

Your herd will be more profitable if you cull—with records.



How the influence of a succession of herd sires increases with each generation of daughters.

herd is an entirely new group of animals. Unfortunately, most dairymen continue year after year to raise heifer calves for replacement purposes that are no better than, or are worse than, the cows they replace. If you carefully select herd sires, you will have not only a new herd, but also a greatly improved herd in a relatively few years.

Many dairymen believe that only the skilled animal husbandman can become a successful breeder of improved dairy cattle. Actually, however, the successful breeder is not endowed with special skill. All you need is sound judgment and production records on which to base your selections and matings.

The primary purpose of a dairy herd improvement association, the

local unit of the National Cooperative Dairy Herd Improvement Program, is to provide you with records and other information you can use in making your herd more profitable.

Since 1935, the U. S. Department of Agriculture, in cooperation with State extension services, has collected thousands of production records from association herds each year and tabulated them to "prove" large numbers of sires. The records are the basis of a nationwide breeding program.

Records are used in analyzing the breeding progress made in many individual herds, with a view to finding improved strains and families from which desirable breeding stock may be selected. Thus, association herds may be looked upon as a mammoth breeding herd of national importance—one that is improved constantly and one from which breeding stock is gradually dispersed to improve the thousands of other herds that make up the Nation's dairy cattle population.

THREE WAYS TO KEEP RECORDS

If your herd is well established, record keeping offers a chance to maintain high standards and to cull undesirable cows.

If your herd is small or recently established, these programs offer you the opportunity to build and improve the herd at the least possible expense.

One of the three National Cooperative Dairy Herd Improvement Program plans—the standard DHIA, Owner-sampler, or Weigh-a-Day-a-Month—is designed for your herd.

Choose the record-keeping system most satisfactory to you. Use the one that serves you best with least cost.

STANDARD DHIA

A typical dairy herd improvement association is a cooperative organization of dairy farmers, usually about 26, who employ a tester or supervisor to keep feed, production, income, and breeding records on their cows.

As the program grows, an area or countywide association will be formed and additional supervisors employed. County associations may join in a Statewide cooperative. Policies, rules, and local programs are coordinated by the State organization.

The supervisor visits each herd in the association once a month. During evening milking, he weighs feed consumed and milk produced

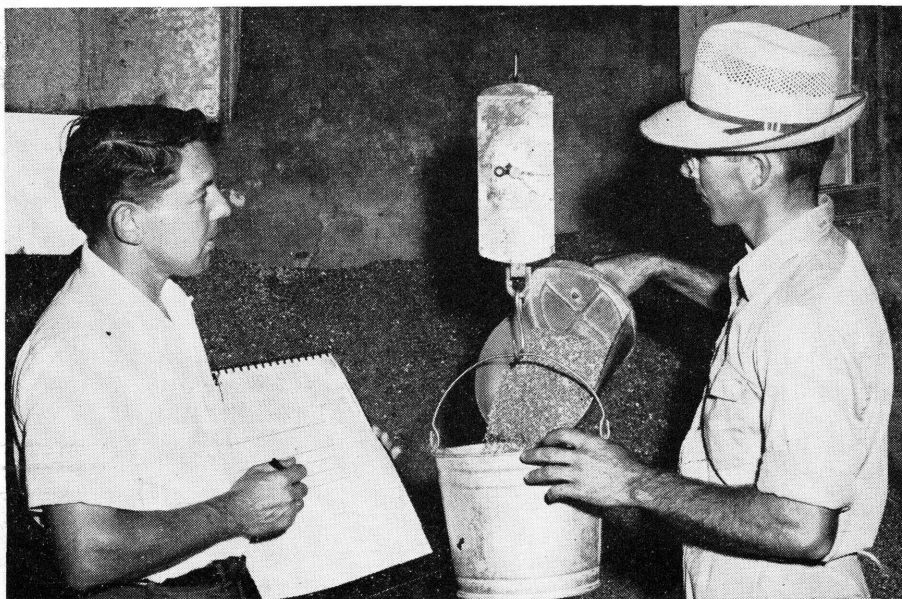
by each cow and saves a small sample of her milk. He follows the same procedure during the milking the next morning. He tests the milk samples for butterfat.

The weights and tests for 1 day are used to calculate each cow's milk and butterfat production for the month. At the end of the year a record summary for each herd is made.

Numerous studies have shown that yearly records based on weights and tests for 1 day each month are within 2 percent of the actual milk production and 3 percent of the butterfat production.

The supervisor enters the figures in the herd-record book that you keep to use as a guide in managing your herd. The supervisor assists you in keeping a record of each cow's calves. Identification records are maintained and recorded.

The supervisor also helps you keep breeding records on your



N-29304

The supervisor enters the records that you use in managing your herd.



N-29305

In Owner-Sampler testing, the supervisor shows how to take milk sample and report test-day records.

cow. These records are needed to indicate the breeding worth of sires used in your herd. A tabulation of production of unselected daughters of a sire is compared with the average for their dams. This tabulation is the proved-sire record.

When available, registration numbers are used. Nonregistered animals are eartagged to establish their identity. Thus, a lifetime record for each cow is developed.

Frequently, the supervisor can suggest the changes in feeding or management of the herd or individual cows that the records show are needed.

OWNER-SAMPLER

In Owner-Sampler testing, the dairy herd improvement association supervisor leaves sample bottles and record sheets at your farm each month. You weigh the milk from each cow in your herd and

save a sample for testing. The association supervisor picks up the milk-weight records and the milk samples on his regular visit to your herd. Samples are tested and records for each cow are computed from your figures. The completed records—of cow and herd—are mailed to you or brought by the association supervisor on his next visit.

The use of Owner-Sampler records is limited to your own herd. Because the weights and samples are not obtained by a disinterested person (the association supervisor), these are treated as private records. The records are not used for proving sires, and they seldom are acceptable for use in selling surplus stock.

You can use Owner-Sampler records as a guide for feeding individual cows according to production by recording the amount of grain fed each cow and the amount

of roughage fed to the herd, for culling the low-producing cows, and for selecting cows whose heifers should be raised for herd replacements.

Owner-Sampler records can be used for starting an improvement program in many dairy herds; but as plans for building your herd develop, you may want to place your herd on standard DHIA to receive full benefit of the testing program.

WEIGH-A-DAY-A-MONTH

The Weigh-a-Day-a-Month record plan is designed to help you obtain private, simple-but-adequate record information to help you improve your dairy herd. Only the

milk yield is recorded. No butterfat samples are taken; average butterfat production of the herd is obtained from the monthly milk check. You take the milk weights of each cow in the herd—morning and evening—on the 15th of each month. Record these weights on a special form you can obtain from your county agricultural agent. Send the form to the computing service, where monthly and yearly records are calculated. The report you send includes milk records for each cow for the month, production to date, monthly herd records, and year-to-date herd totals. Completed monthly reports for the individual cows and for the herd are mailed to you.

Steps required in each of the three plans in the National Cooperative Dairy Herd Improvement Program

Standard DHIA	Owner-Sampler	Weigh-a-Day-a-Month
Supervisor weighs milk.....	Owner weighs milk.....	Owner weighs milk.
Supervisor weighs feed.....	Owner weighs feed.....	Owner weighs feed.
Supervisor enters figures.....	Owner enters figures.....	Owner enters figures.
Supervisor handles forms.....	Supervisor picks up forms.....	Owner mails forms.
Supervisor takes milk samples.....	Owner takes milk samples.....	
Supervisor or central laboratory tests milk for butterfat.	Supervisor or central laboratory tests milk for butterfat.	
Supervisor or central office calculates official records.	Supervisor or central office calculates unofficial records.	Central office calculates unofficial records.
Supervisor eartags animals.....	-----	
Breeding record is compiled.....	-----	
Production records used in proved-sire program.	-----	
Supervisor helps owner use records to improve his herd.	Owner uses records to improve his herd.	Owner uses records to improve his herd.
Cost: About 45 cents per cow per month.	Cost: About 25 cents per cow per month.	Cost: About 5 cents per cow per month.

HOW TO USE THESE PLANS

The following examples will show you how to interpret and use standard DHIA, Owner-Sampler, or Weigh-a-Day-a-Month plans.

STANDARD DHIA

The standard DHIA record is designed to provide detailed information for the dairy farmer.

When the associations started, the calculation of all records for the cows and herds was done manually by the supervisor, who copied the records in the dairyman's DHIA Herd-Record Book.

A number of States now are using large electronic calculating machines located in computing centers to calculate and print, from the test-day data reported by the supervisors, the dairymen's month-to-month and annual reports on their cows and herds.

Gradually, the supervisor's calculation work is being moved into these computing centers. Various types of printed monthly reports are produced by the different computing centers. One of the more complete monthly reports used in many States is shown.

Production-to-date, monthly and year-to-date herd totals, total and average feed cost, and income over feed cost for the herd are shown.

At the top of the form for May, the first line of the herd summary tells John Doe, the owner—

- Eighty-nine percent of his 40 cows on test were in milk this month. On a daily basis, the herd average was 28.5 pounds of milk and 1.0 pound of butterfat.

- Each cow, on the average, was fed daily (exclusive of succulents

and pasture) 8 pounds of concentrates and 10 pounds of dry roughage. On a percentage basis, 31 percent of the nutrients came from concentrates, 19 percent from dry roughage, and 50 percent from pasture. These percentages should be important to John, year after year, because they indicate the most economical source of nutrients on his farm for his herd.

- Roughage was fed at the rate of 2.6 pounds per live hundredweight of cow. Monthly records show rate of roughage feeding most profitable to John.

Average income over feed cost per cow was \$0.63 per day.

The second summary line gives herd totals for the past 12 months. The herd produced 626,000 pounds of milk and 22,670 pounds of butterfat. It was fed 184,200 pounds of concentrates, 351,600 pounds of succulents, and 190,000 pounds of dry roughage, and had pasture for 10,340 cow days. The value of product for the past 12 months totaled \$28,160; and the total feed cost was \$10,180, including \$5,780 cost of concentrates. This provided an income over feed cost of \$17,980.

The third summary line gives herd average for the previous 12 months.

During that period the herd averaged 41.7 cows that were in milk 84 percent of the time. This percentage indicates good herd management, because the cows averaged about a 60-day dry period.

In addition to the average per-cow production (13,235 pounds of milk and 479 pounds butterfat) and feed data, a feed index is reported. The feed index of 110 is a comparison of the feed intake with feed required to maintain a

Feed cost per hundredweight of milk was \$1.63.

The herd produced an average of 4,300 pounds of milk per acre supporting the dairy enterprise.

- Bess is in milk, producing on

• Bess, Gale, and Mary should be dried off in order to have a dry period before freshening (as indicated by an asterisk "*" in column, "Carried Calf").

● Ohio is in milk, producing on test day 39.3 pounds of milk testing 3.5 percent. She was injured during the previous month. (Code “4” in last column, “Conditions Affecting Records”.)

• Emma, Barbar, Judy, and Star have completed a 305-day lactation record (symbol “#” in last column), which is listed together with the records to the end of the test period.

BN-6954

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- Fredka has an incomplete record of 303 days because she was sold (code "2" and "□" in last column).

- Nancy and Tinsel have lactation records terminated (symbol "□" last column) by a new freshening date.

- Evie, Alcart, Jupite, and Nellie have been in milk more than 60 days with no breeding date reported (indicated by an asterisk "*" in column "In Milk"). They should be bred.

- Evie's record was affected by mastitis (code "5" in last column).

John can find much more information here when he gets acquainted with the report and reads it routinely.

OWNER-SAMPLER

A completed Owner-Sampler machine-calculated record will resemble the standard DHIA record and is used in the same way.

You cannot use your Owner-Sampler records in the National Sire-Proving Program, because the supervisor does not sample and weigh the milk.

WEIGH-A-DAY-A-MONTH

The Weigh-a-Day-a-Month report form for April gives the following useful management information on the herd:

At the bottom of the form, the second line of the herd summary tells that 8 cows have been on test for the month. On a monthly basis the 8 cows gave 5,540 pounds of milk and 211 pounds of butterfat. Test was 3.8 percent.

The previous 26 cow-months test produced 25,670 pounds of milk

and 950 pounds of butterfat. Test was 3.7 percent.

Average milk production per cow per month was 693 pounds with 26 pounds of butterfat. Average test was 3.8 percent.

Total brought forward for value of product was \$985. Total cost of feed was \$578, with an income over feed cost of \$407.

Similar findings occur under the month's total. Here, the product value was \$208 while total feed cost was \$141. Thus, income over feed cost was \$67.

Total to date gives \$1,193 as the value of product and \$719 as the total cost of feed. Income over feed cost is \$474 for 34 cow-months on test.

The per cow average value of product for the month was \$26. Total cost of feed was \$17.62; income over cost was \$8.38.

The typed data make up the report for the cows and herd for April. The handwritten part is the report for May.

The report tells this about the individual cows in the herd:

- Star has milked every day for the entire month. She is in milk, and produced 25 pounds of milk per day last month, or a total of 750 pounds for the month. Her total since fresh, is based on 121 days in milk. During this time, she produced 3,210 pounds of milk. This month, she gave 8 pounds of milk during morning test and 11 pounds during evening test.

- Sally freshened April 18 (in "Remarks" column).

- Bell freshened April 21 (in "Remarks" column).

- May was sold on May 5 before a milk weight could be obtained (in "Remarks" column).

on the 15th of the month—74 pounds. Total grain fed for the month was 2,290 pounds.

Amount of hay fed the herd on the 15th of the month is found by weighing the bales or forkfuls until amount fed herd each day can be estimated. In this example, the herd was fed 90 pounds of hay each day.

Amount of silage fed the herd on the 15th of the month is found by weighing scoops, tubs, or carriers of silage until silage fed herd for one day can be estimated. In this example, the herd was fed 120 pounds of silage.

Current price of feed on farm is used. Feed is neither underpriced nor overpriced. The county agricultural agent advised on this.

An accurate feed-cost record is of great value. In this example, the price of grain was \$3.40 per hundredweight; hay \$1.00 per hundredweight; and silage, \$0.50 per hundredweight. "Feed Cost for Herd" for grain was \$78 (calculated in even dollars).

Pasture cost is determined by multiplying the number of cows in the milking herd on pasture on the 15th of the month by the per cow per month price of pasture. The price of pasture may be the going rate of pasture rental in the community according to the quality and feed value of the pasture. In this example, the price was \$6 per cow per month; 9 cows in the herd cost \$54. Total cost of feed for the herd for the month is calculated by adding the figures in column "Feed Cost for Herd." In this example, the total cost was \$179.

A carbon copy of this report is mailed to computing center designated by the county agricultural agent where the records for May are computed.

HOW TO JOIN

To join any of these plans, see your county agricultural agent or your State extension dairyman.

The standard Dairy Herd Improvement Association plan provides you with the most complete records possible on your cows and herd. When you join the standard DHIA plan, you also join the local dairy herd improvement association. You sign a membership agreement covering the rules of standard DHIA record keeping and the schedule of fees to cover the cost of DHIA record keeping. (Approximate cost is 45 cents per cow per month, but costs may vary.)

The Owner-Sampler plan of record keeping offers you the most economical way to get milk and butterfat production records through a calculating service.

An Owner-Sampler plan usually is operated in conjunction with the standard DHIA plan.

You sign a membership agreement to weigh and record weight of milk of each cow each month, take milk samples for testing, and make arrangements to pay the fees. (Approximate cost is 25 cents per cow per month, but costs may vary.)

The Weigh-a-Day-a-Month plan requires as little time and effort of a dairyman as is consistent with helpful record keeping. You agree to weigh and record the milk yield for each cow once each month and pay a year's fee in advance for record keeping on your herd. (Approximate cost is 5 cents per cow per month, but cost may vary.)

Your county agricultural agent can give you additional information about any of the three plans of record keeping.